

30. The method of claim 26, wherein for the improved localization and shape determination of the inhomogeneity the temperature profile in the sample is differently set in subsequent measurements.

31. The method of claim 23, wherein, in subsequent measurements, the magnetic field is measured at different distances to the sample.

32. The method of claim 23, wherein one simultaneously measures with several measuring sensors.

REMARKS

The Present Invention

The present invention is directed to a testing device for detecting and localizing material inhomogeneities in electrically conductive samples. The device comprises a holder for the samples to be tested, a temperature setting device for forming a temperature profile in the sample, and at least one measuring sensor for the contactless measurement of the magnetic field outside the sample. Several measuring sensors are provided at a different distance to the sample.

The present invention is also directed to a method of detecting and localizing material inhomogeneities in electrically conductive samples. The method comprises bringing the sample to a predetermined temperature profile and contactlessly measuring the magnetic field outside of the sample using several measuring sensors provided at a different distance to the sample.

The Pending Claims

Claims 15-32 are currently pending. Claims 15-22 are directed to the testing device, whereas claims 23-32 are directed to the method.

Amendments to the Claims

The claims have been amended to correct claim dependencies in view of the renumbering of the claims by the Office. No new matter has been added by way of these amendments.

The Office Action

The Office has rejected claims 12-14 under 35 U.S.C. § 112, second paragraph, as allegedly indefinite and claims 15, 16, 23, 31 and 32 under 35 U.S.C. § 103(a) as allegedly obvious in view of and, therefore, unpatentable over Moulder et al. The Office has objected to

claims 17-22 and 24-30 as dependent upon a rejected base claim. Reconsideration is hereby requested.

Discussion of Rejection under 35 U.S.C. § 112, second paragraph

The Office has rejected claims 12-14 under Section 112, second paragraph, as allegedly indefinite for depending from canceled claims. This rejection is believed to be moot in view of the amendments to the claims.

Discussion of Rejection under 35 U.S.C. § 103(a)

The Office has rejected claims 15, 16, 23, 31 and 32 under Section 103(a) as allegedly obvious in view of and, therefore, unpatentable over Moulder et al. The Office has objected to claims 17-22 and 24-30 as dependent upon a rejected base claim. This rejection and this objection are traversed for the reasons set forth below.

According to the Office, Moulder et al. discloses all of the claimed subject matter, except for using a plurality of sensors and rotating the samples. The Office considers such features to be obvious matters of design choice, alleging that they are old and known in the art.

Applicants respectfully submit that the instantly claimed invention is not obvious in view of Moulder et al. Moulder et al. uses a time variation of the temperature distribution within the specimen (claim 1, row 8, line 8). This results in a variation of the local electrical conductivity within the specimen (claim 1, row 8, lines 16-18). This, in turn, changes the eddy current signal. When flaws, cracks, voids or holes are present, the temperature distribution is different from the situation without these regions of zero thermal and electrical conductivity (claim 3). Signatures in the eddy current signal give hints to such defects. Moulder et al. uses an eddy current probe (claim 1, row 8, line 7), which generates an a.c. magnetic field and detects the field and especially its changes caused by defects within the specimen. The magnetic field is generated within the measuring system.

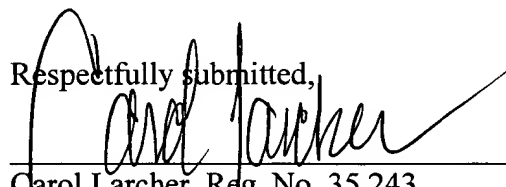
In contrast, the present invention uses a spatial variation of the temperature distribution within the specimen (claim 15). This temperature profile generates electrical current at metallic material inhomogeneities within a surrounding of other metal (claim 15). This is due to a thermoelectric effect. These electrical currents, in turn, generate magnetic fields, which leak out of the specimen. These magnetic fields are detected with a magnetic sensor (claim 15 and 23). The magnetic sensor does not generate magnetic fields. Rather, the magnetic fields are generated within the specimen.

In view of the foregoing, the instantly claimed device and method cannot be said to be obvious in view of Moulder et al. Accordingly, Applicants request the withdrawal of this rejection.

Conclusion

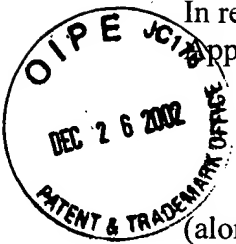
In view of the above remarks, the application is considered to be in good and proper form for allowance and the Office is respectfully requested to pass this application to issuance. If, in the opinion of the Office, a telephone conference would expedite prosecution, the Office is invited to contact the undersigned attorney.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Carol Larcher", is written over a horizontal line.

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Date: December 19, 2002



CERTIFICATE OF MAILING

I hereby certify that this AMENDMENT AND RESPONSE TO OFFICE ACTION (along with any documents referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, Washington, D.C. 20231.

Date: December 19, 2002

Kathleen M. Grant

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